

CLAIMS

1.) Method for producing multi-layer containers of thermoplastic material, for storing and transporting liquid fill material, in particular fill materials that are flammable or potentially explosive, wherein the containers are provided with an exterior layer that cannot be permanently electrostatically charged and from which electric charges can be drained,

characterized in that

the permanently electrostatically non-chargeable or electric charge-draining properties of the exterior layer are adjusted by adding and admixing to the plastic material a limited quantity of a specific polymer-based compound, and that the layer thickness of the exterior layer is made so thin, that the transparency or translucency of the compounded exterior layer is diminished not at all or only insignificantly, so that the fill level of a fluid filled in the container can be easily optically detected.

2.) Method according to claim 1,

characterized in that

a limited quantity of color pigments is added and admixed to the plastic material of the exterior layer, thereby slightly coloring the plastic material of the exterior layer, whereby the two-dimensional distribution of the thin exterior layer and its layer thickness distribution can be visualized and evaluated, wherein however the translucency of the compounded and weakly color-pigmented exterior layer is diminished only slightly, so that the fill level of a fluid filled in the container can still be easily optically detected.

3.) Method according to claim 1,

characterized in that

a limited quantity of optical brightening agents is added and admixed to the plastic material of the exterior layer, which under normal conditions produces a

barely recognizable coloration of the plastic material of the exterior layer, wherein however under special illumination, for example under illumination with black light, the two-dimensional distribution of the thin exterior layer and its layer thickness distribution can be visualized and evaluated.

4.) Method according to claim 1, 2 or 3, characterized in that

a fusible, easily stretchable thermoplastic material (polymer), such as LLDPE (Linear Low Density PolyEthylene) or LDPE (Low Density PolyEthylene) is employed as a plastic material for the thin exterior layer, whereas a cold-impact-resistant HDPE material (High Density PolyEthylene) with a high molecular weight is employed for the center layer(s) and/or for the interior layer(s) of the multi-layer container.

5.) Method according to claim 1, 2, 3 or 4, characterized in that

the thickness of the exterior layer of the plastic container is adjusted to a thickness of approximately 0.25% to 5%, preferably approximately 2.0%, of the wall thickness of the plastic container.

6.) Method according to claim 1, 2, 3 or 4, characterized in that

the thickness of the exterior layer of a large-volume plastic inner container of a pallet container with a capacity of approximately 1000 liters is adjusted to approximately 0.05 mm to 0.2 mm, preferably to approximately 0.1 mm, for an average wall thickness of approximately 2 mm to 2.5 mm.

7.) Container made of thermoplastic material, for storing and transporting liquid fill material, in particular for flammable or potentially explosive fill materials, with at least one gas-tight and fluid-tight closable fill and/or drain opening

disposed in the top container wall or in the container cover, wherein the container is provided with an exterior layer that cannot be permanently electrostatically charged and from which electric charges can be drained,

characterized in that

the permanently electrostatically non-chargeable or electric charge-draining properties of the exterior layer are adjusted by adding and admixing to the plastic material of the exterior layer a limited quantity of a specific compound and the layer thickness of the exterior layer is formed to be so thin that the transparency or translucency of the compounded exterior layer is diminished not at all or only insignificantly, so that the fill level of a fluid filled in the container can still be optically detected.

8.) Container according to claim 7,

characterized in that

a limited quantity of color pigments is admixed to the plastic material of the antistatic exterior layer, thereby slightly coloring of the plastic material of the exterior layer, whereby the two-dimensional distribution of the thin exterior layer and its layer thickness distribution can be visualized and evaluated.

9.) Container according to claim 7,

characterized in that

a limited quantity of optical brightening agents is admixed to the plastic material of the antistatic exterior layer, which under normal conditions effects a barely recognizable coloration of the plastic material of the exterior layer, wherein however under special illumination, for example under black light, the two-dimensional distribution of the thin exterior layer and its layer thickness distribution can be visualized and evaluated.

10.) Container according to claim 7, 8 or 9,
characterized in that
the thickness of the antistatic exterior layer of the plastic container is adjusted to approximately 0.25% to 5%, preferably approximately 2.0%, of the wall thickness of the plastic container.

11.) Container according to claim 7, 8 or 9,
characterized in that
the thickness of the exterior layer of a large-capacity inner plastic container of a pallet container with a capacity of approximately 1000 liters is adjusted to a layer thickness approximately 0.05 mm to 0.2 mm, preferably approximately 0.1 mm.

12.) Container according to claim 7, 8, 9, 10 or 11,
characterized in that
the plastic material for the thin exterior layer comprises a fusible, easily stretchable thermoplastic material (polymer), such as LLDPE (Linear Low Density PolyEthylene) or LDPE (Low Density PolyEthylene), whereas the plastic material for the center layer(s) and/or the interior layer(s) of the multi-layer container comprises a cold-impact-resistant HDPE material (High Density PolyEthylene) with a high molecular weight.

13.) Container according to one of the preceding claims 7 to 12,
characterized by
a configuration of a thin-wall cuboid interior container (12) of a pallet container (10) with a fill port in the top wall and a lower side drain port, on which an extraction fitting (18) is attached which is made of a permanent antistatic and/or electric charge-draining plastic material.